Reclamation of Severely Gullied Land: Natchez Trace State Forest

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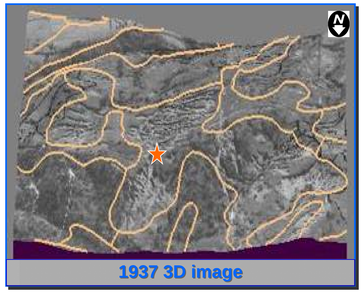
Use and Management

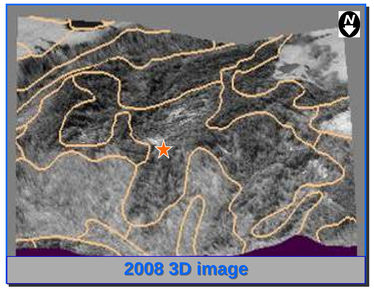
- problem: soil properties conducive to erosion and inhibit land stabilization
- 60 -100% land clearing without soil conservation for cotton farming in the early 1900's
- abandoned gullied lands planted in pines
- low intensity land category - adverse soil conditions (7s, LCC)
- headwall erosion injuring adjacent upland

historic landscape

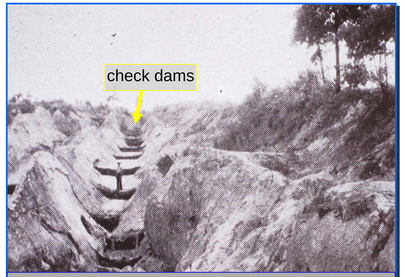
present day landscape



1937 3D image



2008 3D image



check dams made of brush, poles, logs

Geology and Soils

- exposed coastal plain sediments
- soils have aluminum toxicity and low fertility
- low infiltration, rapid runoff, dense soil material
- modern soils forming in overlying 72 million year old and younger and clastic marine
- groundwater percolation reworks iron and McNairy and Coffee formations
- unconsolidated nature of the upper units contribute to the extensive erosion

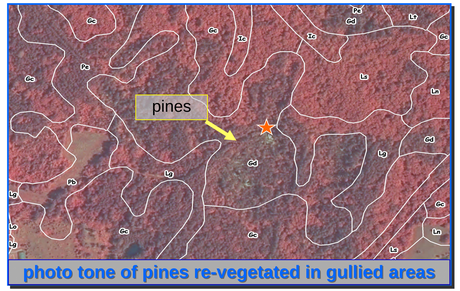
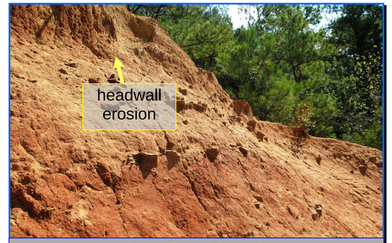
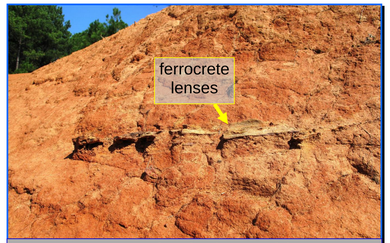


photo tone of pines re-vegetated in gullied areas



erosion of stabilized land

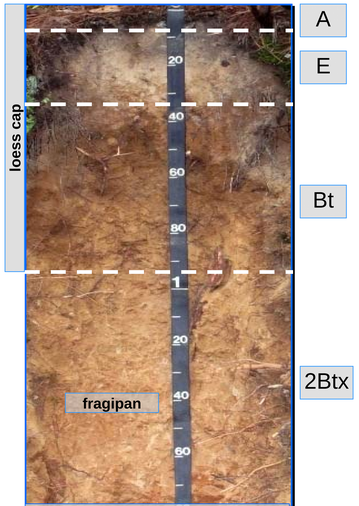


cementation by iron oxides

★ Indicates viewing location

leaf off image of hardwoods in non-gullied area

iron and silica crusting



Providence soil profile

Management Requirements

- controlling headwall erosion
- trap sediments using brush dams or other means
- best reclamation species is pines
- establish vegetation cover
- enhancement of organic matter (pine needles)
- longer rotation (100+) w/o intermediate management

Summary

- planting trees alone without establishing a ground cover will not prevent erosion
- erosion inhibits re-vegetation
- reclamation costs generally prohibitively high
- additions of fertilizer and lime not generally effective or economical

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